

REMARKS

Reconsideration of this application is respectfully requested in view of the following remarks.

Claims 1-28 remain pending in this Application. In the Office Action:

- Claims 1-2, 4, 6, 11-13, 15, 18-19, 22-25, and 27-28, were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,998,069 to Cutter et al. (“Cutter”).
- Claims 3, 5, 9, and 14 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cutter in view of U.S. Patent Application Publication No. 2003/0076423 to Dolgoff.
- Claims 7-8, 16, 20, and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cutter in view of U.S. Patent Application Publication No. 2002/0112824 to Ballard et al. (“Ballard”).
- Claims 10 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cutter in view of U.S. Patent No. 5,682,214 to Amako et al. (“Amako”).
- In the Response to Arguments, the Examiner maintained the previous rejection of the claims under 35 U.S.C. § 103(a) and 35 U.S.C. § 102(b). Specifically, to the support the rejection, the Examiner asserted that Cutter discloses a quartz substrate coated with shielding material in its solid state as the mask.

Rejection of Claims 1-2, 4, 6, 11-13, 15, 18-19, 22-25, 27-28 under 35 U.S.C. §102(b)

Applicant respectfully traverses the rejection of Claims 1-2, 4, 6, 11-13, 15, 18-19, 22-25, 27-28 under 35 U.S.C. §102(b) for the reasons set forth below. As an initial matter, Applicant

notes that claim 21 was not expressly rejected under 35 U.S.C. §102(b), but it does appear in a parenthetical listing of claims in the body of the §102(b) rejection. It is believed that the Examiner intended to reject claim 21. Thus, the patentability of claim 21 under 35 U.S.C. §102(b) will be addressed below, together with claims 1-2, 4, 6, 11-13, 15, 18-19, 22-25, and 27-28.

Cutter does not anticipate claims 1-2, 4, 6, 11-13, 15, 18-19, 21-25, and 27-28 for at least the two reasons discussed below.

- Cutter fails to disclose the feature recited in claims 1, 12, 18, and 23, wherein a programmable patterning structure comprises a plurality of individually addressable pixel elements, wherein at least one of the pixel elements comprises a layer of solid state electro-optical material.
- Cutter fails to disclose a layer of solid state electro-optical material having a birefringence that varies according to applied voltage.

Cutter fails to disclose the feature recited in claims 1, 12, 18, and 23, wherein a programmable patterning structure comprises a plurality of individually addressable pixel elements, wherein at least one of the pixel elements comprises a layer of solid state electro-optical material.

Independent claims 1, 12, 18, and 23 recite, among other things, a patterning structure comprising at least one pixel element that contains a layer of solid state electro-optical material having a birefringence that varies according to an applied voltage. According to one embodiment of the invention, solid state electro-optical materials provide several features not present in liquid crystal electro-optical materials, including at least reduced degradation in the

presence of UV and DUV radiation, faster switching rates, and smaller dimensions for the electro-optical devices (see the specification at page 16, paragraph 00058).

Although Cutter discloses a programmable mask, the programmable mask is a *liquid crystal* display and not a solid state electro-optical material (see Cutter, col. 6, line 66 to col. 7, line 10). As a result, Cutter is deficient at least because it fails to teach a programmable patterning structure that comprises a plurality of individually addressable pixel elements, wherein at least one of the pixel elements comprises a layer of *solid state* electro-optical material.

In the Response to Arguments, as noted above, the Examiner asserted that Cutter discloses a quartz substrate coated with shielding material in its solid state as the mask. The Examiner relies on column 8, lines 14-26 of Cutter to support this assertion. Apparently, the Examiner infers that the quartz substrate referred to in Cutter constitutes a pixel element comprising a layer of solid state material. However, Cutter does not teach a plurality of individually addressable pixel elements, wherein at least one of the pixel elements comprises a layer of solid state electro-optical material, as recited in independent claims 1, 12, 18, and 23 of this Application. The text cited by the Examiner reads as follows:

The electronically controlled mask 11 of FIG. 3A is electronically alterable so that three different states are provided via the display of mask 11. Two of these states allow 100% transmission of light, with one state 180 degrees out of phase with the other state. The third state acts as an opaque material for blocking 100% of the light. By providing a three state mask 11, the mask 11 is reconfigured to provide the equivalent pattern provided by a mask that uses a transparent material, such as quartz, having light blocking materials deposited on the underside, along with notched surfaces to vary the phase of the transmitted light in order to form a desired pattern.

In the above excerpt, the mask disclosed by Cutter is an electronically controlled mask (see Figure 3A of Cutter). Cutter teaches that the electronically controlled mask, in turn, is a *liquid crystal* display (column 6, lines 66-67). The text relied upon by the Examiner to support the assertion that Cutter discloses a layer of *solid state* electrooptic material, does not disclose a programmable patterning structure (*mask*) comprising the solid state electrooptic layer. Rather Cutter teaches that the programmable patterning structure (mask) provides the *equivalent pattern* as that provided by a quartz mask having blocking material deposited on the underside. Thus, contrary to teaching a mask having a solid state layer, the programmable (liquid crystal) mask of Cutter is a *replacement* for a quartz mask. The solid state quartz mask disclosed by Cutter (only for the purposes of comparison to the invention of Cutter) is not a programmable electrooptic layer. As disclosed in the above excerpt from Cutter, the quartz mask acts as a conventional mask by having "light blocking materials" on its underside (see also Figures 1b, 3b, and 4b of Cutter). Thus, Cutter fails to teach a programmable patterning structure wherein at least one of the pixel elements comprises a layer of solid state electro-optical material, as recited in claims 1, 12, 18, and 23. At least for this reason, Cutter does not anticipate claims 1, 12, 18, and 23, and their rejection under 35 U.S.C. § 102(b) should be withdrawn.

Cutter also fails to disclose a layer of solid state electro-optical material having a birefringence that varies according to applied voltage.

Additionally, even if Cutter did disclose a layer of solid state electrooptic material (which Cutter clearly does not do), Cutter fails to disclose that the layer (liquid crystal display) has a birefringence that varies according to an applied voltage. Rather, Cutter merely discloses using applied voltage to rearrange or switch the polarization of the liquid crystal molecules so that light

is either reflected or absorbed in the region bound by the electrodes (see Cutter et al., col. 7, lines 6-10). For this additional reason, Cutter does not anticipate claims 1, 12, 18, and 23, and their rejection under 35 U.S.C. § 102(b) should be withdrawn.

The rejection under 35 U.S.C. § 102(b) of dependent claims 2, 4, 6 and 11; 13 and 15; 19, 21 (rejection appears to have been intended), and 22; and 24, 25, 27, and 28, as being anticipated by Cutter, was predicated on the rejection of base claims 1; 12; 18; and 23, respectively. Because claims 1, 12, 18 and 23 are not anticipated by Cutter for the above reasons, the rejection of dependent claims 2, 4, 6, 11, 13, 15, 19, 21, 22, 24, 25, 27, and 28, under 35 U.S.C. § 102(b) also is not proper and should be removed.

Rejection of Claims 3, 5, 7-10, 14, 16-17, 20 and 26 under 35 U.S.C. § 103

Claims 3, 5, 9, 14, were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cutter in view of Dolgoff. Claims 7-8, 16, 20, and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cutter in view of Ballard. Claims 10 and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Cutter in view of Amako.

For the reasons set forth below, Applicant respectfully traverses the rejection of all the above-listed claims under 35 U.S.C. § 103(a).

- Because Dolgoff fails to make up the deficiencies of Cutter discussed above concerning the rejection of base claims 1 and 12, the combination of Cutter and Dolgoff fails to render dependent claims 3, 5, 9 and 14 obvious under 35 U.S.C. § 103(a).
- Because Ballard fails to make up the deficiencies of Cutter discussed above concerning the rejection of base claims 1, 12, 18, and 23, the combination of Cutter and Ballard fails to render obvious dependent claims 7-8, 16, 20, and 26 under 35 U.S.C. § 103(a).

- Because Amako fails to make up the deficiencies of Cutter discussed above concerning the rejection of base claims 1 and 12, the combination of Cutter and Amako fails to render obvious dependent claims 10 and 17 under 35 U.S.C. § 103(a).

Because Dolgoff fails to make up the deficiencies of Cutter discussed above concerning the rejection of base claims 1 and 12, the combination of Cutter and Dolgoff fails to render dependent claims 3, 5, 9 and 14 obvious under 35 U.S.C. § 103(a).

Claims 3, 5, 9 and 14 depend from corresponding independent claims 1 and 12 and therefore include the feature of, among other things, a layer of solid state electro-optical material having a birefringence that varies according to an applied voltage.

As discussed above, Cutter is deficient at least because it discloses an electronically controlled mask that is a liquid crystal display and not a solid state electro-optical material (see Cutter, col. 6, line 66 to col. 7, line 10). The Examiner acknowledges that Cutter is further deficient because it fails to disclose the electro-optical material recited in dependent claims 3, 5, 9, and 14. The Examiner relies on Dolgoff for disclosing this feature.

Dolgoff is directed to a light valve such as an active liquid crystal display (LCD) between crossed polarizers, utilizing individual transistors to control each pixel area of the LCD (see Dolgoff, the abstract). Since Dolgoff is directed to an LCD, it fails to make up the deficiencies of Cutter discussed above. In particular, Dolgoff fails to teach or suggest at least a layer of solid state electro-optical material. Thus, the combination of Cutter and Dolgoff does not teach or suggest all the limitations recited in claims 3, 5, 9, and 14.

In view of the foregoing differences between claims 3, 5, 9, 14 and the cited art, Applicant respectfully submits that a *prima facie* case of obviousness based on the combination

of Cutter in view of Dolgoff has not been established. Accordingly, the rejection of claims 3, 5, 9, 14, under 35 U.S.C. § 103(a) should be withdrawn.

Because Ballard fails to make up the deficiencies of Cutter discussed above concerning the rejection of base claims 1, 12, 18, and 23, the combination of Cutter and Ballard fails to render obvious dependent claims 7-8, 16, 20, and 26 under 35 U.S.C. § 103(a).

Claims 7-8, 16, 20, and 26 were rejected under 35 U.S.C. §103(a) as being unpatentable over Cutter in view of Ballard. Applicant respectfully traverses this rejection. Each of claims 7, 8, 16, 20 and 26 depends from a corresponding one of independent claims 1, 12, 18 and 23 and therefore includes the feature of, among other things, a layer of solid state electro-optical material having a birefringence that varies according to an applied voltage. As discussed above, Cutter is deficient at least because it discloses an electronically controlled mask that is a liquid crystal display and not a solid state electro-optical material (see Cutter, col. 6, line 66 to col. 7, line 10). The Examiner acknowledges that Cutter is further deficient because it fails to disclose an actuator configured to adjust the position of the electro-optical material in a direction parallel to the beam of the radiation incident on the pixel element. The Examiner relies on Ballard et al. for disclosing this feature.

Ballard is directed to an apparatus for mounting a pellicle to a reticle (see Ballard, the abstract). Ballard fails to disclose solid state electro-optical materials or any other type of electro-optical materials. Thus, the combination of Cutter and Ballard fails to teach or suggest all the limitations recited in claims 7, 8, 16, 20, 26.

In view of the foregoing differences between claims 7, 8, 16, 20, 26 and the cited art, Applicant respectfully submits that a *prima facie* case of obviousness based on the combination

of Cutter in view of Ballard has not been established. Accordingly, the rejection of claims 7, 8, 16, 20, 26 under 35 U.S.C. § 103(a) should be withdrawn.

Because Amako fails to make up the deficiencies of Cutter discussed above concerning the rejection of base claims 1 and 12, the combination of Cutter and Amako fails to render obvious dependent claims 10 and 17 under 35 U.S.C. § 103(a).

Claims 10 and 17 were rejected under 35 U.S.C. §103(a) as being unpatentable over Cutter in view of Amako. Applicant respectfully traverses this rejection.

Claims 10 and 17 depend from corresponding independent claims 1 and 12 and therefore include the feature of, among other things, a layer of solid state electro-optical material having a birefringence that varies according to an applied voltage.

As discussed above, Cutter is deficient at least because it discloses an electronically controlled mask that is a liquid crystal display and not a solid state electro-optical material (see Cutter, col. 6, line 66 to col. 7, line 10). The Examiner acknowledges that Cutter is further deficient because it fails to disclose a polarizing filter to attenuate the radiation outgoing from the pixel elements. The Examiner relies on Amako for disclosing this feature.

Amako is directed to an optical apparatus for controlling a wave front of a coherent light including at least a coherent light source, an electrically addressable liquid crystal device having a plurality of pixels receiving the light from the light source and a signal generator (see Amako, the abstract). Amako discloses a liquid crystal display but fails to disclose solid state electro-optical material. Thus, the combination of Cutter in view of Amako fails to teach or suggest all the limitations recited both in claims 10 and 17.

In view of the foregoing differences between claims 10, 17 and the cited art, Applicant respectfully submits that a *prima facie* case of obviousness based on Cutter in view of Amako


Serial No.: 10/721,789
Art Unit: 1756

Attorney's Docket No.: 081468-0306887

has not been established. Accordingly, the rejection of claims 10 and 17 under 35 U.S.C. § 103(a) should be withdrawn.

In view of the foregoing, all of the claims in this case are believed to be in condition for allowance. Should the Examiner have any questions or determine that any further action is desirable to place this application in even better condition for issue, the Examiner is encouraged to telephone Applicant's undersigned representative at the number listed below. Applicant also respectfully requests that the Examiner telephone Applicant's undersigned attorney to arrange a personal interview if the Examiner is not persuaded by the above remarks.

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